

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
20 January 2005 (20.01.2005)

PCT

(10) International Publication Number  
**WO 2005/006808 A1**

(51) International Patent Classification<sup>7</sup>: **H04R 3/00**,  
G10L 21/02

(21) International Application Number:  
PCT/BE2004/000103

(22) International Filing Date: 12 July 2004 (12.07.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
2003903575 11 July 2003 (11.07.2003) AU  
2004901931 8 April 2004 (08.04.2004) AU

(71) Applicant (for all designated States except US):  
**COCHLEAR LIMITED** [AU/AU]; 14-16, Mars Road,  
LANE COVE, New South Wales 2066 (AU).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DOCLO, Simon**  
[BE/BE]; Groene Wandeling 19, B-2970 SCHILDE (BE).

**SPRIET, Ann** [BE/BE]; Nieuwstraat 20, B-8870 IZEGEM (BE). **MOONEN, Marc** [BE/BE]; Termeredellelaan 7, B-3020 HERENT/WINKSELE (BE). **WOUTERS, Jan** [BE/BE]; Leming 125, B-3320 HOLSBEKE (BE).

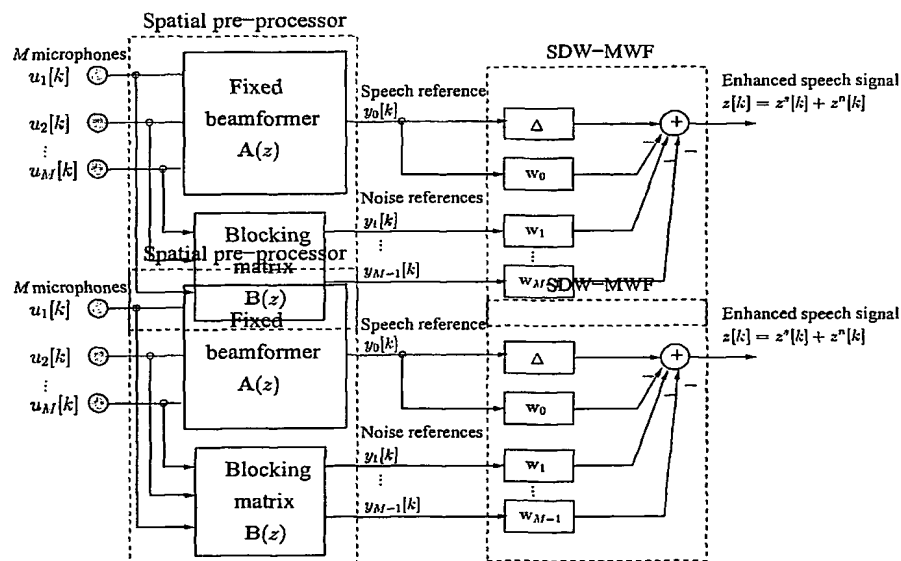
(74) Agents: **VAN MALDEREN, Eric** et al.; OFFICE VAN MALDEREN, Place Reine Fabiola 6/1, B-1083 BRUXELLES (BE).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AF, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: METHOD AND DEVICE FOR NOISE REDUCTION



(57) Abstract: The present invention is related to a method to reduce noise in a noisy speech signal, comprising the steps of - applying at least two versions of the noisy speech signal to a first filter. The first filter outputs a speech reference signal and at least one noise reference signal, - applying a filtering operation to each of the at least one noise reference signals, and - subtracting from the speech reference signal each of the filtered noise reference signals. The filtering operation is performed with filters having filter coefficients determined by taking into account speech leakage contributions in the at least one noise reference signal.

WO 2005/006808 A1



European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

**Published:**

— *with international search report*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*